

STA Online Computer Programming Contest (DWITE)

October 2003

Problem 5

The Maze

A maze can be depicted as a rectangle with 'A', 'B', '#' and '.' characters. The border of the maze is made up of '#' characters, except for the entrance 'A' and the exit 'B'. Walls within the maze are also made up of '#' characters. The path through the maze is made up of '.' characters.

For example, a small maze may look as follows:

```
#A###  
#...#  
###.#  
#...#  
#B###
```

Your job is to write a program that will find the shortest path from 'A' to 'B'. The shortest path will be defined as the least number of dots encountered between the 'A' and the 'B'. To get from 'A' to 'B', you can only travel on the '.' characters. You may only travel through the maze either going up, down, left or right. You may not travel in a diagonal direction.

The input file (DATA5) will contain five sets of data. Each set will contain on the first line two integers R and C, representing the number of rows in the maze and the number of columns in the maze. $2 < R, C < 50$. The next R lines will contain C characters of either 'A's, 'B's, '#'s or '.'s that make up that row.

The output file (OUT5) will contain five lines of data, corresponding to each set of the input file. Each line will contain the shortest path from 'A' to 'B'.

<u>Sample Input (Only two sets given)</u>	<u>Sample Output</u>
5 5 #A### #...# ###.# #...# #B###	7
10 8 ##### #...#.# ###...# A.#.##.# #...#.# ###..#.# #...##.B #..##..# ##.....# #####	13